

## **Shooting With A Purpose In Ice Hockey**

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<p>This project strives to create a comprehensive teaching theory for shooting in the game of hockey.</p> <p>It divides the ice into areas players can and cannot score from. It explains the best areas on the net to shoot at, techniques and tactics that can be taught to increase scoring proficiency from the scoring areas. It also gives techniques and tactics for how to use a shot to create a scoring chance from areas of the ice where the initial shot is not likely to go in. Where on the goalie to shoot to create a quality rebound, or shoot for a deflection.</p> <p>Goaltending techniques are examined and explained. How shooters can use this information in order to gain an advantage when shooting a puck is investigated.</p> <p>The thesis is a project based thesis. The project was a drill manual. The manual consists of shooting drills and teaching methods for those drills that is supported by the theory of the written portion.</p>	
<b>Keywords</b> Ice Hockey, Shooting, Scoring, Tactics of Shooting	

## Table of contents

1	Introduction .....	3
2	Technique .....	4
2.1	Repetition .....	4
2.2	Feedback .....	4
2.3	Power vs. Accuracy and Power With Accuracy .....	5
3	Understanding Scoring vs. Scoring Chances .....	7
4	Analyzing Goalies .....	8
4.1	Where On The Ice Pucks Go In From .....	8
4.2	Scoring Area and Non Scoring Area .....	10
4.3	Where On The Net Pucks Go In .....	11
5	Shooting From The Scoring Area .....	14
6	Shooting From The Slot .....	15
6.1	Timing Shots - Quick Release .....	15
6.2	Timing Shots - Delayed Shot .....	17
6.3	Power and Accuracy .....	20
6.4	Puck Eyes .....	21
7	Shooting From The Goal Mouth .....	23
7.1	Rebounds/Passes .....	25
7.2	Initial Shots .....	27
7.3	Screens/Deflections .....	28
8	Point Shots .....	31
8.1	What is the Purpose .....	31
8.2	Power/Accuracy vs. Quick Release .....	32
8.3	Avoiding a Blocked Shot - Quick Release .....	32
8.4	Avoiding a Blocked Shot - Changing the Shot Lane .....	33
8.5	Avoiding a Blocked Shot – Indirect Shots .....	35
8.6	Shooting With No Traffic .....	35
9	Perimeter .....	37
10	Players Without The Puck .....	38
10.1	Rush .....	38
10.2	Offensive Zone .....	38

11	Product Development .....	39
12	Discussion.....	42
	References.....	44
	Photograph/Table Credits.....	46

# 1 Introduction

The areas on the ice that we can reasonably expect to score with a direct shot, without a screen, tip or rebound are very small. When we do have the chance to shoot from those areas we cannot waste them by simply trying to hit the net. But, what to do when shooting from the areas where we don't reasonably expect to score? Is a shot on net for a rebound the best option? Or is a shot to a teammate's stick for a tip a better choice? Is it a screen shot? Should they use a quick release, or take a little more time and focus on power and accuracy? The answer to these questions and the execution of those answers is "shooting with a purpose". According to Brendan Shanahan (Brown & Stenlund 1997, vii) "when given an opportunity to score you must take advantage of it. When there seems no opportunity to score, you must create it." Every time a player takes a shot, they should have in their mind the reason they are shooting and how he is attempting to use that shot to either score, or create a scoring chance for a teammate. If he understands that, has an idea and is attempting to execute it, then he has a purpose for that shot. He is shooting with a purpose.

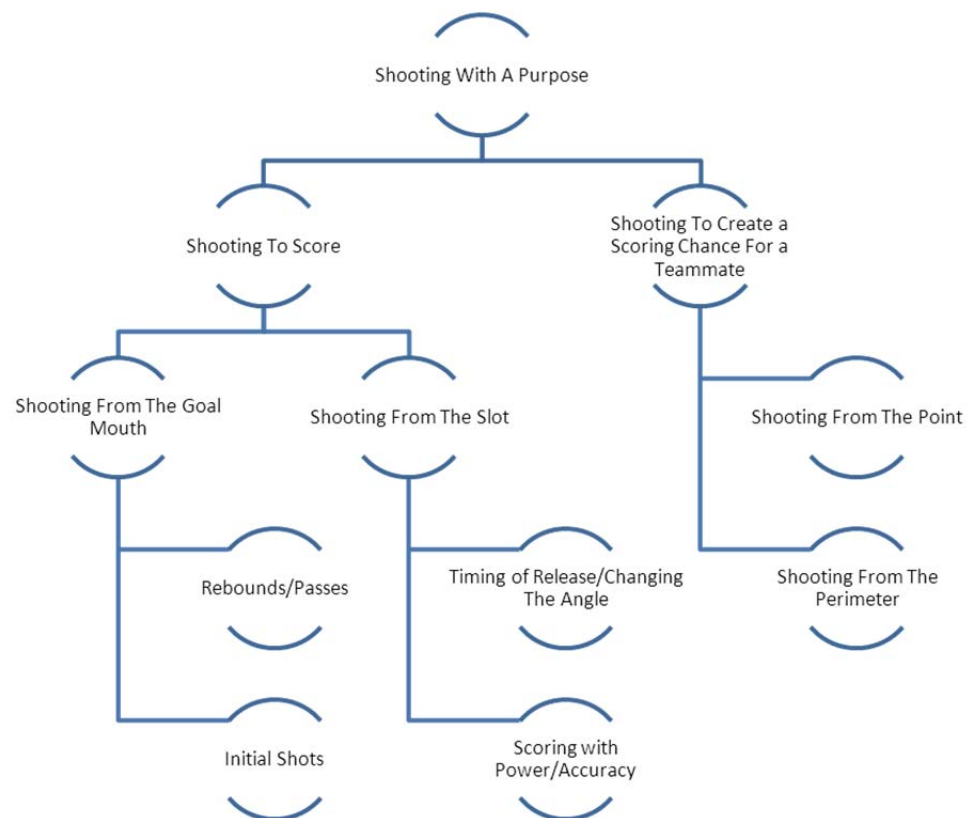


Figure 1 : Framework

## 2 Technique

### 2.1 Repitition

While most of the focus for this project will be on the individual and team tactics regarding shooting there are some key points to mention about technique. Shooting is a skill, and skill can be defined as “the consistent production of goal-oriented movements, which are learned and specific to the task.” (McMorris 2004, 2) It is important to understand that learning to shoot, like any other skill, requires a tremendous amount of repetition. In his book *Outliers: The Story of Success* Malcolm Gladwell wrote about Swedish Psychologist Dr. Ander’s Ericsonn’s theory of needing 10,000 hours of practice to become expert at a skill. Ericsonn studied musical students and determined it was the amount of “deliberate practice” and not an inherent “talent” that allowed performers to perform a skill at an expert level (Gladwell 2008, 35-69). The idea of 10,000 hours of practice overcoming most in-born talent deficiencies has become wildlly popular in coaching, business leadership, and popular culture in general. And, while the number of repetitions that can be completed in 10,000 hours is unknown and whether or not the number is precisely 10,000 hours may be argued, the fact is, when learning a skill an immensely large number of repetitions over years and years with deliberate practice is important.

### 2.2 Feedback

A lot of shots are going to need to be taken, in a deliberate practiced manner in order to master shooting technique. “Deliberate practice entails more than simply repeating a task — playing a C-minor scale 100 times, for instance, or hitting tennis serves until your shoulder pops out of its socket. Rather, it involves setting specific goals, obtaining immediate feedback and concentrating as much on technique as on outcome.” (Dubner & Levitt, 2005) Dubner and Levitt assert that the feedback received should focus on technique as much as an outcome, and while attention must be paid to certain fundamentals in shooting technique, when it comes to a skill like shooting the outcome is far more important, and feedback on the outcome is immediately available

and very reliable. Put a target in a net, and try to hit it. Was the target hit? Or did the puck miss the target? That is immediate feedback on the accuracy of the shot. Further, while our senses may not be entirely reliable for the power of the shot, they are not completely without value either. For more reliable feedback on power, a simple radar gun can be purchased. The radar gun combined with targets can provide immediate and complete feedback to the outcome of the shot. While technique cannot be ignored, especially the fundamental building blocks for a technique, in a skill like shooting

“It is the outcome that is crucial, not how you look while performing the skill. In lay language, skill to perform such tasks often gets mixed up with how one looks while performing the skill. Psychologists call the latter form. Form, however, is not the important factor in such skills but outcome is. It is true that many skilful performers, whose outcome is very good, also demonstrate good form. We can all think of performers who look graceful. When I think of sprinters, who exhibit good form, I think of Maurice Greene. However, when I think of great sprinters, I also think of Michael Johnson. Johnson’s style would not be shown in a coaching manual but he is one of the greatest sprinters of all time. (McMorris 2004,4)

In hockey if you compared the top 10 shooters in the world, you would certainly see some technical similarities, but they would all have slightly different form. The key is when practicing to shoot, you get immediate feedback on the power and accuracy of the shot. It is also important to spend a great deal of time working to shoot with the quickest release possible.

### **2.3 Power vs. Accuracy and Power with Accuracy**

When practicing shots a player must train themselves to shoot hard and accurately, with as quick a release as you can.

Anyone who has shot a hockey puck understands that at some point it is easier to shoot more accurately if you take a shot that’s less than your most powerful. That by putting less power in the shot, you can shoot much more accurately. So that may leave a debate about which is more important, power or accuracy and which should you learn first. It is important to do them both at the same time, but power should be the primary focus on and accuracy, while important should be secondary. It is important

to shoot as hard as you can, and try to be accurate, rather than shooting as accurately as possible and trying to shoot hard. That may seem like a trivial difference, but the difference is huge.

The reason has to do with motor unit recruitment and synchronization. When a muscle is placed under tension, motor units are recruited based on size. “The smaller, slow twitch motor units fire first followed by progressively larger, fast twitch motor units, which further increase the tension. The muscle generates maximum force when all motor units are recruited and are firing at their maximum rate.” (Ackland & Elliott & Bloomfield 2009 117-119) When you first start an exercise that requires the recruitment of more and more motor units there will be a significant “lack of coordination between agonists, stabilizers, and antagonist muscle groups. This lack of muscular coordination is displayed most prominently when beginner resistance trainers attempt to push a barbell in a straight line on the bench press. As the neuromuscular system becomes increasingly proficient with the performance of an exercise, the coordination of the muscles improves, facilitating performance.” (Ackland et al. 2009, 119) This is why it is important to always shoot your hardest while learning accuracy. If you were to shoot at 50% effort and learn accuracy, as you shoot harder and harder, you recruit more and more motor units, those units are going to lack coordination, and you will have to learn accuracy all over again. This learning of accuracy will have to occur every time you incorporate a new motor unit, or every time you increase effort on the power of the shot.

Therefore, a player should shoot their hardest right from the start, and try to be accurate as accurate as possible. Shooters should always aim at a target, but in the beginning the target might be quite large. The entire hockey goal may be the original target for a five to eight year old beginner. When the shooter consistently hits the net with their hardest shot, the net can be divided into four, with the shooter aiming at one of the four quadrants. As the shooter becomes more proficient the net can be divided into six, then nine squares. Eventually top shooters will aim at a part of the net that is as small as the puck itself. The key though, is to shoot as hard as you can the whole time you are learning to shoot accurately, so you don’t have to learn accuracy twice.



### 3 Understanding Scoring Chances vs. Scoring

Now that we have looked at the basics of shooting the puck, we can look into what a player should be thinking when they shoot the puck. In order to do that, it is important to understand the main opponent preventing our shot from going in the goal.

Scoring is mostly approached as an offense vs. defense contest. In order to create offense coaches look at the best way for the five attacking players to break down the five defending players. However, in order to gain a better understanding of how to score we must first look at the best way to beat the goalie, not the five defenders in front of him. We should be looking at what area we need to get the puck to, before we start moving it out from behind our own goal. Looking at how and where we can beat goalies from will give coaches a better and clearer understanding of what exactly is and is not a scoring chance. Using basketball as a parallel, players must be taught how to execute a lay-up before worrying about teaching them a fast-break. Of course a fast break will be necessary for the lay-up but the lay-up is taught first. In hockey we are teaching the fast break first without a clear enough understanding of where we want to shoot from. Our focus is mainly on creating a scoring chance rather than scoring. In order to better understand scoring it is absolutely necessary to first look at goalies, where on the net we can beat them and what areas on the ice we can beat them from. When looking at a modern goalie it is easy to understand why scoring is so hard; “They take up much of the net, have their own personal coaches, and have become some of the best athletes in sports” (Setters 2006).

## 4 Analyzing Goalies

### 4.1 Where On The Ice Goals Are Shot From

Goalies have “blocking areas” and “reacting areas”. Inside the blocking areas it is very difficult to score with an initial direct shot. The goalie knows he has most of the net covered just by being square to the puck. Outside the blocking areas the goalies are forced to react because there is too much net for the shooter to shoot at. The best areas to score on a goalie are the areas that are the right distance from the net (not too far, not too close) and at a good enough angle that the goalie cannot block. In these areas if the shooter aims for the right spot, and has a hard, accurate shot it is next to impossible for the goalie to make a save (Magnusson 2010,). So we need to figure out where the blocking areas are, and where the reacting areas are for a goalie, so we can teach proper shooting philosophies for all of the different areas.

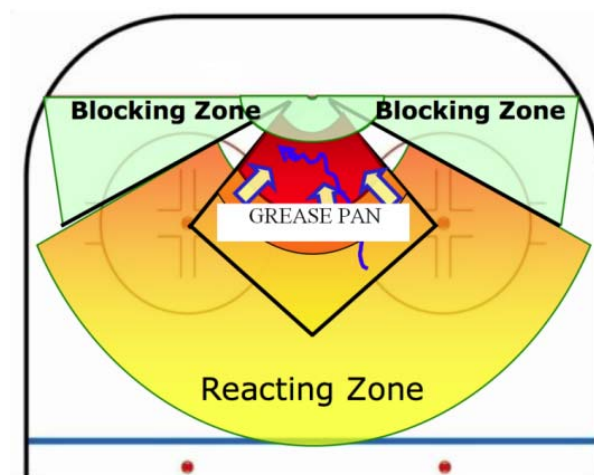


Figure 2

Figure 2. The goalies' general blocking and reacting area. The diamond shape area from the goal to the top of the circles between the face off dots is what Magnusson calls the “Grease Pan”. As we will see it is the area where most goals come from.(Magnusson 2010; Newell & Stenlund, 45)

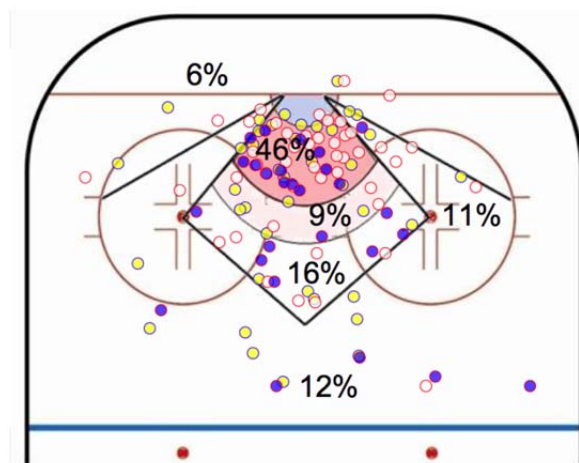


Figure 3

Figure 3. Where on the ice most goals come from. This study is from the 2010 U20 WC and shows a total of 61% of goals are scored from in the ‘grease pan’ (Magnusson 2010)

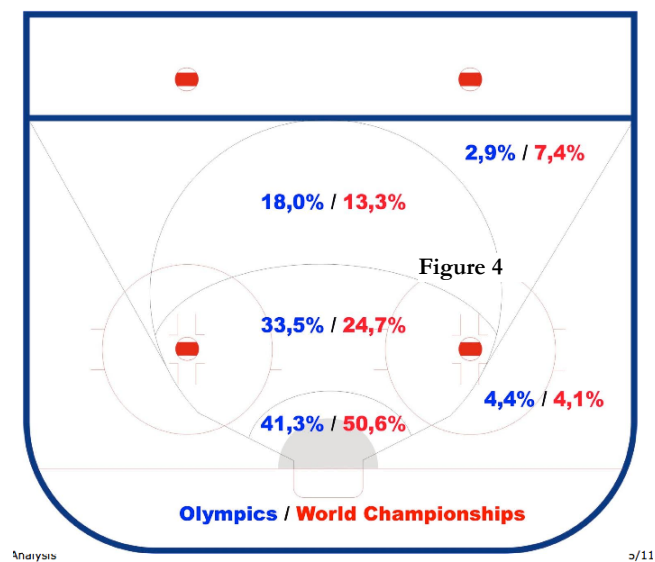


Figure 4

Figure 4. The results of a study done by Mika Saarinen showed that in the 2006 Olympics 72% of goals came from this area and in the 2005 world championships the number was 75%(Saarinen, 2006)

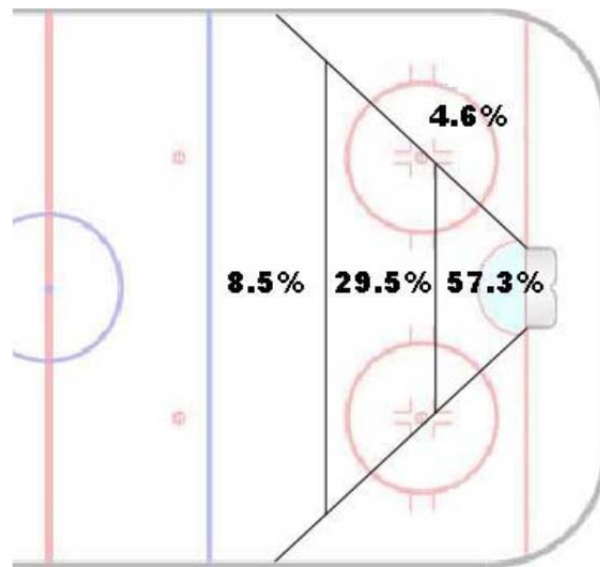


Figure 5

Figure 5. A third study, done on the goals scored in the 2003 World Championships in Helsinki show similar results.(Sumkin & Vuorinen, 2003)

While the shapes of the areas in these studies vary slightly the general areas are similar. There is an area directly in front of the net and one that is just beyond the front of the net that extends to the top of the circles. In one study the second area goes to the top of the circles in a straight line, in another it is a curved line, and in the third it extends outward, but they all cover roughly the same area. All three diagrams show that most of the goals are scored from the area referred to by Magnusson as the “grease pan.” Newell Brown and Vern Stenlund in *Hockey Drills for Scoring* call this area “the red zone” and said it is “a prime location for potential goal scorers to establish position.”(Brown & Stenlund 1997,45)

After seeing that most of the goals are scored from the grease pan, we can divide shooting and scoring into two distinct groups: An area where you can score from and areas where it is very difficult to score from..

## 4.2 Scoring Area and Non Scoring Area

If we look again at Magnusson’s diagram of the goalie’s blocking and reacting zones it is clear that the area where goals are going to be scored from is what he refers to as “the grease pan.” The grease pan is therefore synonymous with “Scoring Area”. If you are going to score you are most likely going to score from that scoring area. In the

scoring area, players should be shooting to score, outside that area it is unlikely a player will score. It is so unlikely that shooters need to be shooting in order to create a second opportunity. Trying to set up a scoring chance for a teammate.(Magnusson 2010)

#### 4.3 Where On The Net Pucks Go In

Now that it is clear where most goals are scored from it needs to be determined where on the net pucks go in. Several studies have been done looking at this, and they have come up with similar results.

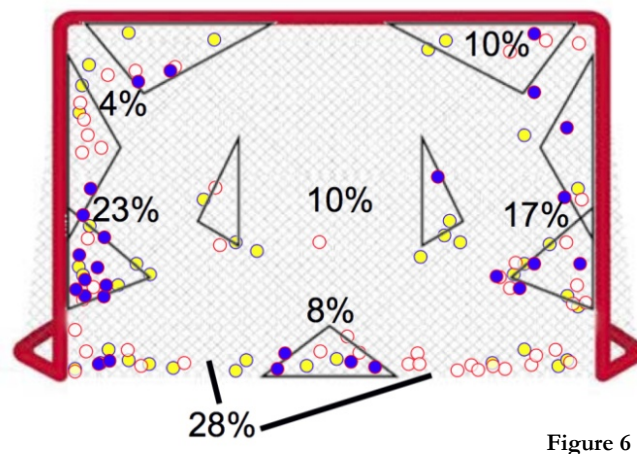


Figure 6

Figure 6. Diagram showing where pucks go in the net using 115 goals from the U20 WC in 2010 Figure 6 showing where 115 goals scored by U.S. Sweden and Canada went in on the net. (Magnusson 2010)

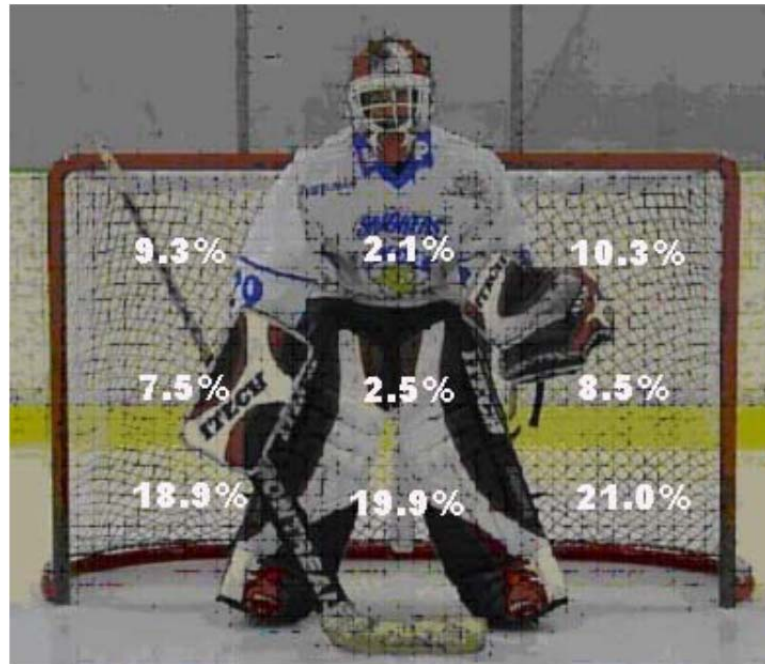


Figure 7

Figure 7. Shows a study from the 2003 world senior championships in Helsinki and shows similar results.(Vuorinen & Sumkin 2003) It is counterintuitive to see that most goals are scored in the bottom part of the net, yet we know with goalies utilizing the butterfly, their goal is to take away the bottom part of the net.

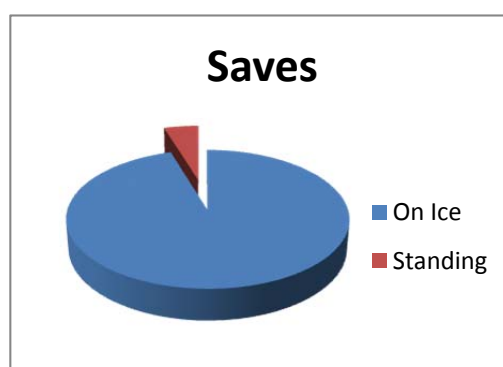


Figure 8

Figure 8. In this chart we see how a vast majority of saves a goalie makes are in the butterfly or another low or on-ice position. This study was shown in Sam Lieblands From Passive to Active Goaltending. It was done by:

following 7 different goalies in 10 professional league games during a international tournament in St.Petersburg, Russia August 2005. Teams in this tournament were, Espoo Blues, Severstal, CKA, Metallurg, Dinamo & Sibir. In this figure, it is showed how these goalies made their saves in 274 saves that were analyzed in this study (Goaliepro.com) The red area shows the percentage in stand up saves 4.7 %. The blue area shows the percentage in butterfly (on ice, low) saves 95.3% . (Liebkind, 2007 )

Patrick Roy, who popularized the butterfly technique said that “the butterfly is the position where you cover the most surface of the ice. I know [a lot] of the goals are scored on the ice. If I can’t cover the ice I’m in trouble.” (Rossiter 1996, 61) So it is clear that goalies are attempting to use the butterfly to take away the lower part of the net for shooters to shoot at, yet most of the goals are going in the lower part of the net. This must mean a great number of goals are scored on unprepared goalies. The shot gets in before they have the chance to get the optimum positioning and get down covering the lower part of the net. This shows the importance of a quick release, when trying to score. Getting the shot away before the goalie is set.

So now that it is clear where most goals are shot from, and where on the net goalies are most often beat, we can take a closer look at shooting with the idea of scoring.

Because it is the area where the most goals are scored, we will look first at what to teach in the Scoring Area. Inside the scoring area, players should shoot to score, not simply be satisfied with hitting the net. The Scoring Area consists of two areas, the goal mouth and the slot.

## 5 Shooting From The Scoring Area

Considering that a high percentage of goals scored in the goal mouth are on deflections and rebounds, the area where shooters have the best chance of scoring on a direct shot is from the slot. The most important part of goaltending is what happens before the shot". The goalie wants to be centred in the net, square to the shot, and at the appropriate depth out from the goal (Magnusson 2010; Corsi & Hannon 2002, 49, 52, 57; Rossiter 1996,69; Daccord 1998, 76, 83, 112). Therefore when possible the shooter should attempt to release the puck before the goalie is ready, even if this means sacrificing some power and accuracy. Brett Hull, who scored 741 goals in the NHL always tried to have the quickest release possible. His focus was getting the puck towards the net as quickly as possible, rather than shooting as hard as he could every time (Rossiter,1996,38). If the shooter is not able to prevent the goalie from being set before he shoots, then he can still eliminate the goalies preparation by delaying his shot, faking a shot, or changing the angle on his release.(Pecknold,2009,30-32) If the shooter can't affect the goalies preparation then he must pick a small part of the net where he has the best chance to score and take the best shot he can at that area.(Magnusson 2010; Rossiter 1996,4) Thinking like this divides shooting from the slot into two areas, timing shots, and power/accuracy shots. The timing shots are attempting to beat the goalie with a quick release, or a delayed shot. The power/accuracy shots are attempting to pick a corner and beat the goalie with the power and accuracy.



## 6 Shooting From the Slot

### 6.1 Timing Shots - Quick Release

As stated earlier the most important part of goaltending is what happens before the save; The goalies preparation. The goalie has to move to get centred in the net, square to the puck, and at an appropriate depth from the goal to get into the best position to make the save. (Magnusson 2010; Corsi & Hannon 2002, 49, 52, 57; Rossiter 1996,69; Daccord 1998, 76, 83, 112) It makes sense then, that the best way to score is to shoot before the goalie is ready. The other way to destroy preparation is delaying. However faking or changing the release point gives the other teams defense more time to defend the shot. So it is best to shoot before the goalie gets ready. Alexander Mogilny said “the more you wait, the less of a chance you are going to get. (Rossiter 1996, 4)

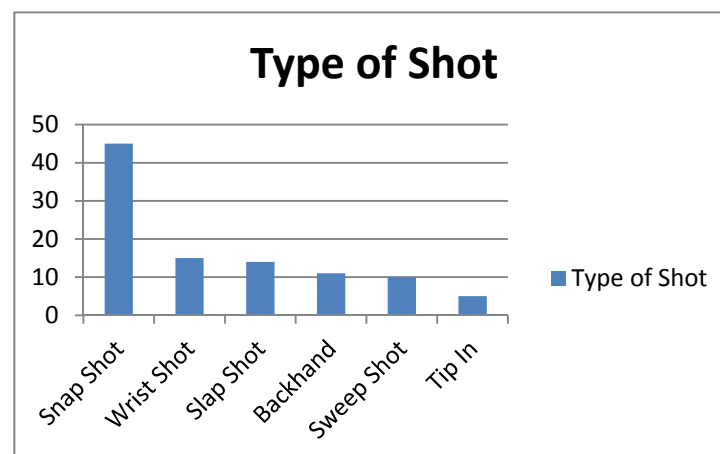


Figure 9

Figure 9. A study of what types of shots goals are scored from done in 2003 shows this to be true.(Vuorinen & Sumkin 2003)

“All the goals has been divided by the type of shot they were made. Shot types were backhand, sweepshot, snapshot, wristshot, slapshot and tip-in/redirection.” (Vuorinen & Sumkin 2005)

A similar study done by the Degree Programme did a study on goals scored in the NHL and found that nearly “60% of all goals are scored with a wrist shot.”(DP Study 2007) It is possible to conclude then that the shots that have the quickest release score a much higher percentage of goals than shooting with a slower release. The quicker you get the puck to the net, the better chance it has of going in.

The quick release shot is a very difficult technique to master. Working with the Slovakian U20 team Stefan Mikes found that “it was difficult [for players] to receive the pass and shoot without delaying. They always did some [stick]-handling. Only one in ten players at the start could effectively quick release the shot from a medium distance.” (Mikes 2011) At such an elite level one in ten players being able to shoot with a quick release is a surprisingly low number. It is important, especially with young players to have patience and understand that their accuracy will suffer if they are focusing on their release. With players under 14 or 15 it is best to teach a “catch and release” quick release rather than a one-timer. A catch and release shot is when they receive the pass and use that reception as their wind up for a wrist shot. The catch and release shot is still probably the most effective weapon for an older player, but a one-timer can be introduced as the player reaches their mid to late teens. The goal with the quick release shot isn’t to pick a small corner, but rather get the puck by the goalie before he is ready to make the save. You can have players set up for quick release shots off an offensive zone play (cycle) or off of the rush, or maybe the first step could just be stationary pass and shoot in the slot. However it is taught, the player is going to miss their target more often when focusing on release. On this shot, the player should allow a larger target area, shooting to give themselves a little more room for error in regards to their target. Shooting quickly has to be driven in to players heads. They constantly have to be preparing to shoot with a quick release. Even without the puck “they should move to areas where they can one-time the puck or shoot quickly.” (Johnston & Walter, 2010)

## **6.2 Timing Shots - Delayed Shot**

Another way to beat a goalie with timing and not allow them to be properly prepared is to shoot with a delayed shot. You can delay the timing on a shot by faking a

shot/pass before you shoot or by changing the angle (changing the release point) of the shot. Remember the most important part of goaltending is their preparation; using “deceptive tactics including faking a shot or a pass or simply looking [a goalie] off” will prevent a goalie from being prepared. (Johnston & Walter, 2010) Another great way to destroy a goalie’s preparation is to change the release point of the shot. It has the added benefit of creating holes in the goalie as they move to reset for the shot.(Pecknold 2009, 30-32) Goalies want to be centred in the net, square to the puck and at the appropriate depth. (Magnusson 2010; Corsi & Hannon 2002, 49, 52, 57; Rossiter 1996,69; Daccord 1998, 76, 83, 112). Changing the release point of your shot changes the angle of your shot – you beat the goalie by causing him to adjust his set position from the original shot angle he set up for. Once the goalie moves a lot of opportunities open up – the five-hole, the corners and redirections that are “harder for him to save when in motion than when set.”(Pecknold 2009, 31) Again the most important concept here is looking at scoring from a goaltender’s perspective. Goalies want to be in the middle of the net, square to the puck and at the appropriate depth (angle). The most important part of goaltending is what happens before the save. If the goalie is properly set before the shot, “it is almost impossible to score on a direct, clear shot.”(Pecknold 2009, 20) Therefore if we cannot release the puck before they are set, then we must try to disrupt their preparation. Using a fake or a change of release point a shooter can wreck a goalies preparation by getting him to make a move on a shot that isn’t coming (fake) or move in order to follow the puck for the shot that is coming (change of release point).



Figure 10



Figure 11

Figure 10. You can see the goalie is set up and prepared perfectly for the shot coming. If this shooter is to shoot the puck without doing anything to disrupt the goalie's preparation, he will have a very difficult time scoring.

Figure 11. If the shooter pulls the puck towards his feet before he shoots he can maybe find some open space or make the goalie open up a hole in his stance. As you can see in Figure 11 the shooter has pulled the puck towards his feet using the toe of his blade. Changing the point of release has opened up space on the glove side of the net.



Figure 12

Figure 12. If the goalie follows the puck in time, and the shot is taken his butterfly will be executed on an angle and he will slide slightly to his glove hand side. This will cause him to slide through the angle and open up some space on the stick side.

So by pulling the puck before releasing it, the shooter creates two ways to score. He can pull it fast and try to beat the goalie on the glove side (for a left handed shooter shooting on a right handed goalie as shown in the pictures) or he can pull it and let the goalie slide through the angle and shoot to the space opened up over the pad on the stick side. The shooter can also fake a shot. Again if we look at Figure 10 on page 18, a goalie who is set and well prepared for a shot there isn't much room to shoot at, and the goalie is well prepared to react to the puck. However, if the shooter were to fake a shot and get the goalie to drop into a butterfly before he shoots as in Figure 13 then:



Figure 13

Figure 13. The goalie is still in a decent position here, but his ability to follow the puck has dramatically decreased. If the shooter were to move the puck even slightly, a lot of net would open up.



Figure 14

Figure 14. You can see the shooter has pushed the puck to his left from the original spot where he faked a shot from. Because the goalie was down, his ability to follow the

puck has been diminished and this has opened up some net to shoot at. Even if the goalie had not gone down, but had simply froze on the fake, his preparation for this save would have been reduced. The percentage of this shot going in compared to the first picture when the goalie was set and prepared are significantly higher.

### 6.3 Power and Accuracy

Shooting with a purpose is very important in the slot. Thomas Magnusson said that if the “shooter aims for the right spot, and has a hard, accurate shot it is next to impossible for the goalie to make a save” (Magnusson 2010). Alexander Mogilny said that “If you get in close, pick the corner, look for the back of the net.” (Rossiter 1996, 4)

If we consider again Magnusson’s illustration in Figure 6 on page 11, showing where goalies are likely to beat it is clear that in order for a shooter to have the best chance to score they need to aim at the outside of the net. However, it is vital to understand that attempting to aim for the spots on the net where you’re most likely to score is going to lead to more shots missing the net.

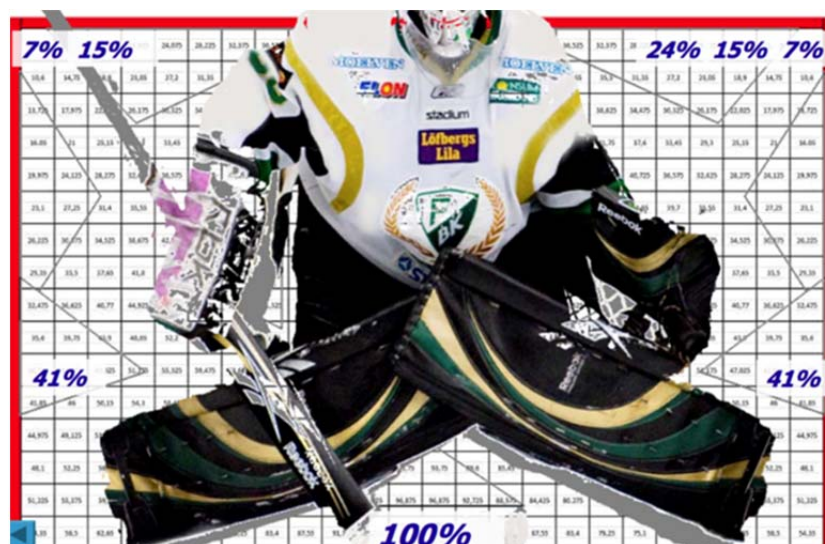


Figure 15

Figure 15. Shows how likely a player is to hit the net when aiming for different spots. Magnusson had a mathematician look at games and create percentages for likelihood of hitting the net given the spot the shooter is aiming for. Shots aimed at the 5-hole

were given a 100% likely-hood of hitting the net. This is probably not true, and it is probable that a shot that missed the net was assumed to be aimed closer to the post. However, if we give leeway for error, the point derived from this study is valid. It is also extremely important if you want to teach scoring instead of shooting to hit the goalie. Comparing the pictures it is obvious that by aiming to the places where you are most likely to score, you are also most likely to miss the net. So as a coach do we want our shooters to hit the net, or do we want them to score?

## 6.4 Puck Eyes

When trying to pick a small corner of the net it is important to show the player what the puck sees. When preparing to shoot “the puck is normally held from three to five feet away on either side rather than directly in front of the body.” This means that the “shooter will see one perspective from their location, whereas the puck would have quite a different view.”(Brown & Stenlund 1997, 46)

### LEFT HANDED SHOOTER



Figure 16

Perspective from eyes



Figure 17

Perspective from puck



## RIGHT HANDED SHOOTER



Figure 18

Perspective from eyes



Figure 19

Perspective from puck

The perspective of the net from the shooter's eyes and the puck are quite different and it is important that shooters understand this. Combining the graphics showing where pucks are most likely to go in the net, and the pictures showing “puck eyes” leads one to believe it will be better to shoot just over the pad to the side of the net your stick is on (left side for a left shot, right side for a right shot) and just over the goalie's shoulders, again on the side of the shooter's stick.



## 7 Shooting From The Goal Mouth

Most goals in hockey are scored from the goal mouth area. The goals scored in the goal mouth can come off of an initial shot, where the player skates the puck into the goal mouth, or has it passed to him, or it can come off a secondary chance, where another player shoots and the goal mouth player tips, screens or gets a rebound. It is important to remember though, that shooting against a prepared goalie is still very difficult in the goal mouth. If the goalie is prepared, the best option for a shooter may still be to shoot for a rebound by shooting five-hole or aiming far pad.

Once goalies are set up for an initial shot, they are very difficult to beat and the spot where shooters can beat them from is very small. Therefore, the easiest and most effective way to beat goalies is through rebounds and screen shots (Nykqvist, 2007).

“Often, goals are scored not from dynamic end-to-end rushes but instead from close-in deflections or redirection of the puck in many key locations around the crease area.” (Brown & Stenlund 1997, 143) When practicing goal mouth

shots/screens/tips/rebounds, it is important again to consider the goalie. Remember the most important part of goaltending is his shot preparation. This is especially true in this area because if the goalie gets perfectly set (centred/squared/depth) before the shot, from this area it will be nearly impossible to find a hole in which to put the puck. So the shooter must be focused on shooting quickly as this will give him the best chance to score. According to Brown and Stenlund:

Developing a quick release means that you must be able to shoot the puck in less-than-ideal circumstances, but, just as important the decision-making process must be sped up as well. Experienced goal scorers eventually realize that the quickness with which a shot is released is a key variable to success in goal scoring, even more important than the hardness of the shot.

The tactic of shooting quickly before the goalie is in position what explains how so many goals are scored in the lower part of the net. In order to score in the bottom third of the net, the shooter must have the shot released well before the goalie is in position. The first thing the goalie will get into the line of the puck will be his pad



Figure 19



Figure 20

and given enough time, he will try to get his glove stretched over as well.



Figure 21



Figure 22

If there is enough time the goalie will get his chest over, and maybe even set in a full butterfly



Figure 23



Figure 24

This takes away most of the holes for a shooter to aim at. So the order the goalie wants to get body parts across the net are, pad (to the post) arm (glove/blocker) and then chest. If his chest can get across he will be in a butterfly. You see in the picture of the goalie in a butterfly, once a goalie is set there is literally no room for a shot to go into the net in the bottom 11'. Therefore a high percentage of goals that go into the net in the bottom 11' have to be against unset goalies.

The reason for dividing goal mouth shots into two subsets is the likelihood of facing a set goalie. In a rebound/cross-crease pass situation, the goalie will be more likely to be

in a poor position at the time of the shot. In an initial shot situation, the goalie should be able to read the play better and be in a much better set position before the shot is taken.

## 7.1 Rebounds/Passes

While most of the shooters focus in this area must be a quick release, he must also attempt to get the puck elevated, at least over 11' or the height of the goalies pad. This will force the goalie to do more than just get a skate to the post. He will have to get a glove there as well in order to make the save.

Remembering that the goalie wants to get his pad, then glove, then chest across in that order, you can see in the two pictures of Roberto Luongo stretching to get to the post that it takes more time and a better push for him to get his glove across on the left. If shooters in the goal mouth can get pucks away very quickly, they will score a lot of goals. If they can get pucks away very quickly over the 11' (the height of the pad) they will score more, and if they can get pucks away quickly to the top part of the net they will score more still. If the goalie does get set before a shot can be released, there will not be holes to shoot at.



Figure 25



Figure 26



Figure 27

Figures 25,26,27. Show three different techniques a goalie can use to get set for a shot inside the goal mouth (all three pictures are taken from the perspective of the puck): As you can see there is almost no room for the puck to get in the net. If a shooter is going to score from this position it will be absolutely necessary in order to score that the shooter moves the puck before shooting in order to create a hole.

This can be done by pushing the puck to the middle and shooting far side over the pad as shown in figure 28 and 29.



Figure 28



Figure 29

Figure 28,29. You can see by pushing the puck to the middle the shooter was able to open space to the far side. The goalie in and attempt to follow the puck will extend his right leg out and move into his butterfly. So, in order to score the shooter will likely have to go over the blocker side pad, like in figure 29 and 30 or five hole in figure 31.



Figure 30



Figure 31



If the shooter has dynamic skill he can try to pull the puck short side and go to the top corner.



Figure 32



Figure 33

Figure 32. The goalie is set for the shot and has the whole net covered.

Figure 33. The player has pulled the puck towards the goal line and there is room on the short side over the goalies catching hand shoulder. This is an extremely difficult shot to execute.

## 7.2 Initial Shots

By initial shots we are talking about a shot that is taken by the puck carrier who gained possession outside the goal mouth area and skated it into the goal mouth area.

These leads to a situation where the goalie is almost certainly set and ready for a shot, because he did not need to move to follow the puck like in a pass, rebound or deflection situation. This means that in tight you are going to be facing a goalie in an area where it is very difficult to find a hole. Again looking at the pictures of the set goalie it is difficult to imagine scoring with a high percentage of shots against the goalie in this position. All of the options that were given above for moving the puck can be used again. Pushing or pulling the puck to create space far side over the pad, or five-hole or, the shooter must “jam the net” by shooting five-hole, or off the far toe to create a goal mouth scramble and a loose puck that can be knocked into the net by the shooter or a teammate.

In all cases it is important to remember that if the goalie is prepared, scoring is extremely difficult. Destroying the goalie's preparation with a fake, or a change of release point takes time, and gives the defense an opportunity to defend and prevent a shot. So even in the goal mouth shooting for rebounds is extremely important and very often the most efficient way to score.

### 7.3 Screens, Deflections

When attempting to tip a shot, it is paramount that a player gets in front of the goalie in order to screen him at the same time he is trying to tip. "Taking shots through traffic (players in front of goaltender) will obviously distract the goaltender or deny him the opportunity to see the puck." (Walter, Johnston 2010) It is more difficult to tip the puck from this position but since screening and rebounds are easily the most effective ways to score (Nykqvist 2007) it is definitely worth the trade off to make the shot harder for the goalie to see.



Figure 34

Correct



Figure 35

Incorrect

When working on Goal Mouth scoring it is important that all drills start with the player trying to get directly in front of the goalie in order to screen. The only time a player does not want to be directly in front of the goalie, is if the original shot is coming from a very high scoring area. In this case it is better to "slip" off to the back door.



Figure 36

Figure 36. Shooter is outside the top of the circles:



Figure 37

Figure 37. As the shooter is moving inside the top of the circles



Figure 38

Figure 38. Net front player “slips” to the back door

In Figure 36 the shooter is outside the dots and outside the top of the circles. The net front player should be in front of the goalie screening in this situation. In Figure 37 the puck carrier has moved closer to the net and is now inside the dots and inside the top of the circle. Now the net front player should look to become a scoring threat himself. The scorer is inside the scoring area and can score with a clear shot from this distance. Also, by backing off to the back door, it prevents the goalie from coming out as far because he has to be prepared for a pass. It also allows the shooter the maximum amount of net to shoot at.



## 8 Point Shots

The place where “shooting to hit the net” costs shooters the most goals is in the frying pan. However, the most dangerous spot on the ice to have a “shooting to hit the net” mentality is on point shots. It is the opposing teams’ wingers’ job to get into the attacking defenceman’s shot lane in order to prevent a shot on net from the point. In the last 10 to 15 years a very high level of importance has been put on blocking shots. It is practiced and stressed by coaches, and demanded from players. (Pecknold 2009 56,64-65) If the coach has told the defenseman that when he shoots he must hit the net, and the defending winger has done his job and got himself in the shot lane and is able to block the shot, the defenseman is left with two options; shoot into the defending player’s shin pads, or not shoot, and play the puck harmlessly into the corner. Neither one of these is a great option. The shot in the shin pads often results in the puck being cleared from the offensive zone, and sometimes ends up in a breakaway or odd man rush for the other team. A puck played back into the corner is often a 50-50 loose puck in a very safe place for the defense. In today’s game most defensive zone systems have the wingers playing quite low in order to defend against the cycle. The forwards collapsing down leave the offensive defensemen uncovered making them a very dangerous weapon in the offensive zone.(McSorley 2009; Setters 2006) If we are going to maximise the efficiency of shots from the point we must coach defenseman from the point not to shoot to hit the net, but to shoot with a purpose.

### 8.1 What’s the Purpose?

So if it shouldn’t be demanded that defensemen hit the net, then what is the purpose for their shots. The most important thing is first to get the shot by the shot blocker; the worst thing a defenseman can do is have his shot blocked at the point. The second thing they have to try to do is get the puck to the goal mouth area. He can do this with either a direct shot, or indirectly off the end boards or by a tip or redirection.

The point shot “doesn’t have to be [the hardest] shot, just get it to the front of the net. There is nothing more frustrating for a coach than having two forwards open in front

of the net and the defenseman has a shot blocked because he's trying to shoot harder rather than quicker"(Sator, 2006)

## **8.2 Power/Accuracy vs. Quick Release**

We talked about power and accuracy vs. release when shooting from the slot and it is important as well in point shots. According to McSorley it doesn't matter how hard the defensemen shoot. He in fact bars his point men from taking slap shots in most circumstances. The key isn't how hard the shot is, but simply how quickly it gets to the goal mouth area. Getting it past the shot blocker is the most important thing. Hitting the net isn't extremely important because if the shot misses the net by a foot on either side there is an opportunity for it to be tipped by a teammate or deflect to a teammate with an opportunity to score on an unprepared goalie in the goalmouth where goals do get scored from. The whole key for defensemen when shooting from the blue line is getting the puck to the goal mouth area. Wrist shots can also be used effectively if taken high when there is a good screen on the goalie. If a goalie is screened he is likely to try to take away the lower part of the net and look low through traffic to find the puck. If a defenseman can get a puck through traffic to the top corner there is a good chance it can go in. A wrist shot, if taken high, will not dissuade teammates from screening the goalie. A couple blasted slap shots taken on their upper body though, will soon see the forwards standing away from the front of the net. McSorley also explains that a "shot taken at least 30 cm off the ice can easily be deflected in any direction." A shot that is taken very low in comparison, is very difficult to tip into the top part of the net. (McSorley 2009; Sator 2006; Setters 2006)

## **8.3 Avoiding a Blocked Shot - Quick Release**

The most important thing for point shots is that they get through and the best way to do that is to use a quick release to get the puck to the net before a shot blocker can get in the way of it. (Mcsorley, 2009; Sator 2006; Setters 2006) This again will likely mean taking a wrist shot or a snap shot. He is not looking to score with a wrist shot from the blue line, but he probably won't score with a slap shot from the blue line either. A wrist shot has a better chance of getting to the net, and with players in and around the

goal mouth this becomes a dangerous offensive situation. A wrist shot is also an easier shot for screening forwards to tip. In his presentation at the IIHF coaching symposium in Riga in 2006 Jim Setters stressed the importance of “getting pucks to the net” showing many examples of defenseman taking wrist shots and snap shots quickly. A lot of the shots were not really hard shots or the most accurate shots, but shots released quickly. While showing the video Setters stressed repeatedly just “get it to the net.” (McSorley 2009; Sator 2006; Setters 2006)

#### **8.4 Avoiding a Blocked Shot - Changing The Shot Lane**

If the defenseman cannot get the shot off before the winger closes the shot lane down he can still get the puck to the net by changing the shot lane. By taking two or three quick steps to the middle of the ice before shooting he can create a clear lane to the goal mouth for the puck. (Setters, 2006) Previously we have talked about “changing the angle” when shooting on the goalie and this is the equivalent on a shot-blocker. By moving the puck and changing the shooting lane a defenseman can open up a once closed lane.



Figure 39



Figure 40

Figure 39. The defenseman is getting ready to shoot as the opposing team’s winger is coming out to defend him.

Figure 40. The winger has completely closed down the shooting lane.



Figure 41



Figure 42

Figure 41,42. The defenseman can now re-open the shooting lane by moving the puck to either side of the shot blocker.

A quick release snap/wrist shot after two or three quick steps is going to get the shot off before the winger can correct and get back in the shot lane. A faked shot, possibly getting the shot blocker to commit and go down on the ice also opens up the opportunity to move the puck and get the shot to the goal mouth.

## 8.5 Indirect Shots

If the defenseman cannot get the puck to the net before the winger shuts down the shooting lane, he still has options that we must teach him. One is shooting at a teammate's stick going towards the net. The defenseman can take a shot that the forward can tip, or one-time, or do a catch-and-release shot. All of this will depend on whether or not the attacking forward is on his forehand or backhand, how close he is to the net, and how much time and space he has. Another option that needs to be shown to defenseman is using the end boards to get the puck to the goal mouth.



Figure 43

Figure 43. If the defenseman in shoots wide on the short side (left side of the net), about a third of the way from the net to the side boards, the puck will bounce out to the slot. If he shoots about 2 meters left of the left post, the puck will bounce off the end wall and come out the other side where it might be banged in by a player on the far side of the net.

## 8.6 Shooting With No Traffic

Goalies are too good for defenseman to score on from the blue line without traffic. Therefore [A defenseman will] need to rely on teammates in front of the net to redirect, deflect, screen or score on rebounds. (Pecknold 2009, 32). Defensemen at the blue line are so far from the goal “that a shot without traffic between the shooter and the goalie in many instances is a giveaway.” (Walter & Johnston, 2010) Therefore, logic tells us, that if we are shooting from the blueline we must wait for traffic to be in front of the goal before taking a shot. This doesn’t have to be a guy standing right in front of the goalie screening him. It could be a player skating through the slot providing a mid-ice screen/tip or just someone going through the goal mouth. But when the defenseman is ready to shoot if there is nobody between him and the goalie, a shot on goal is probably not the best idea. He should look first to wait until traffic has a chance to form in front of the net, or make a pass to his defense partner if the shooting lane is getting closed down, or shoot to one of his teammate’s sticks for a redirect or tip.

## 9 Perimeter

The last area to talk about is the area inside tops of the circles but outside the face off dots. In this area if a player is to shoot, he must hit the net, but it's not enough to simply hit the net. "Elite goalies train for years to control rebounds – their careers depend on it. They are going to catch high shots; redirect low shots directly into the corners, out of danger; or smother mid-height shots. However, they have a much harder time controlling shots that are six to 12 inches above the ice." (Pecknold 2009, 32) He must aim five-hole and attempt to get a rebound into the slot or around the goal mouth. The shooter from the boards and the players in the slot without the puck should think of a shot from the boards as a pass. (Setters 2006) players shooting from the side boards need to understand they are not shooting to score, but instead are shooting to get the puck into the scoring area for another player. Looking at the diagrams in Magnusson's presentation and the results from Saarinen's study, it is clear that the shooting area does not extend towards the side boards past the face off dots. So a shooter can create a very dangerous, high percentage scoring opportunity from the perimeter (outside the dots) but most likely not on their initial shot. They can't shoot to score from outside the dots and they can't shoot to hit the net. A shot to the short side will be an easy rebound for the goalie to put behind the net. A shot taken at about mid-pad on the far side will be easy for the goalie to send the rebound into the far corner. The hardest shot a player can take, directed near the five-hole or far side toe outside the reach of the goalies stick, and elevated above the goalies stick, is the optimal shot to create a rebound in the slot.

## **10 Players without the puck**

It has long been a hockey cliché that the player with the puck is not the dangerous one, it is the player without the puck that is the most dangerous. According to Ken Krzywicki, author for the website Hockey Analytics “the goal rate for rebound shots of 32.8% is 3.7 times higher than the overall goal rate of 8.9%, indicating their high quality.” (Krzywicki 2010) If the goal is more likely to be scored on a rebound, then the player who does not currently have the puck must be a focus.

### **10.1 Rush**

Mike Babcock in his 2005 presentation at the IIHF international coaching symposium stressed in his presentation on creating offense that off the rush the first forward without the puck (This player is labelled - F2) “must drive the middle lane”. (Babcock 2005) Babcock showed many offensive rushes and showed F2 going to the inside of the weak side defenseman. This tactic allows the player to be in a perfect position to gather any rebounds that F1 (the puck carrying forward) might shoot.. This, according to Babcock, also makes it easier for F2 to take a pass from his teammate, as the puck only has to go through one defenseman not two. A hard driving forward will also “inevitably take a defensive player with him and, in doing so create space behind him for the next player behind him” (Pecknold 2009, 20) We have seen how many goals are scored from the goal mouth and the slot, so off the rush it is incredibly important to get a player to the front of the net, and this makes it easier also to get a player into the slot. You now have two players who are in the highest scoring areas on the ice. This is incredibly difficult to defend. This mentality of a middle drive, urgently getting the offensive players going towards the net must be adopted by players in all offensive situations.

### **10.2 Offensive Zone**

Though it is important to get players to drive the net off the rush, it is also important to get a player to the front of the goal in offensive zone or cycle play. We have talked about how hard it is to score on a goalie who can see the puck, and who does not have

to fight through traffic. Players on the cycle should “move and create” rather than “watch and wait.”(Pecknold 2009, 19) A stationary player in the high slot on the cycle looking for a one timer is quite easily covered. Players should look to break down the defensive zone play by driving hard to the net. Getting players to the front of the net you increase the opportunities for rebounds and also tip ins and deflections. Getting to the goal mouth is an “aggressive hockey strategy in which a forward charges toward the opponent’s net in hopes of deflecting a shot, banging a loose puck, obstructing the goaltender’s view and simply creating mayhem that could lead to a scoring chance for his team.”(Pecknold 2009, 18)

Once players have the mentality of getting to the net to create havoc for goaltenders and creating more rebounds, then they have to be prepared to shoot quickly when they get the puck in order to prevent the goalie from setting up for the second shot. All the techniques that were talked about in goal mouth scoring have to be prepared for when the player does not have the puck. As the player is driving the net, or already in front of the net they have to have the mentality that the puck is going to come to them and they are going to shoot quickly once it does. We have seen that such a high percentage of goals are scored from the goal mouth that it reasons that the players that are willing and determined to work as hard as they have to in order to get to the front of the net and the ones willing to accept the physical punishment associated with staying in that area, are the ones who are going to be able to consistently score. Once all of the players on a team have the mentality of driving the net, occupying space in the goalmouth and being ready to shoot when the puck is loose in the goal mouth or slot, it will become easier to convince the shooters to that shooting for a rebound or a tip is a good idea. If they know that there is a good chance pucks will be scored after they shoot for a scoring chance rather than a goal, shooters will be more likely to shoot for a scoring chance instead of a goal. Players both with and without the puck will begin to understand that “a shot from the side boards [can be] a pass to the goal mouth/slot area via a rebound.(Setters 2006) It is likely the easiest way to get the puck to the goal mouth area, but it is only effective if the players without the puck are driving the net and occupying the space in the goal mouth and slot.



## 11 Product Development

I spent the fall and winter of 2008 working with Canadian hockey players from the ages of six to 15 teaching primarily “shooting”. The parents and coaches of the players had two concerns that were far more common than any other. The first one, especially for the younger players was proper technique. This is quite easy to teach and there are many quality coaches and programs working on this in every hockey arena around the world. The second most prevalent concern that the parents had, once the player had the basic shooting technique was “why does my son/daughter always shoot right at the goalie?” This is a harder question to answer but I believe that the number of times kids are told to hit the net in practice plays a role in shooters aiming for the middle of the net where the goalie is. My goal is to create a more comprehensive teaching philosophy based on scoring, not hitting the net. Getting the players to understand the reason they are taking a shot, so they can shoot with a purpose.

The most important thing is figuring out how goals will be scored; where on the ice they are shot from, and where on the net they go in. That divides the ice into two areas, areas where you are likely to score, and areas where you are unlikely to score. I then researched the game from the point of view of the goalie. Presentations, books, drills and theory for goaltenders. What are they trying to accomplish? And, therefore what as a shooter should we be trying to negate. Once you understand the different techniques goalies use for different shots you can better understand how to shoot from those areas. The goal mouth area is going to produce different types of goals then goals from the slot. So players need to be thinking differently in those areas. That is the foundation for my manual. Every shot a player takes, they should know if they are in an area where they can score from, or if they are in an area where they should be trying to create a chance for a teammate. I then looked into coaching offensive hockey. What tactics and techniques were coaches teaching to create scoring chances. From different points on the ice, from different situations what did the highest level of coaches teach their players in order to create scoring chances. When I had the theory of how goalies were beat, and scored on, and how coaches created the scoring chances I started looking at different drills and how they could be put into the theme of shooting with a purpose. My focus when designing the drill manual was not

the drills themselves but rather the teaching points that go into the drills. Every drill that includes a shot, should be used to teach shooting with a purpose. If there is a shot in the drill, that shot must have a purpose. A coach can use any and all of the drills that he currently uses, but the reason why the player is shooting, and the purpose for that shot needs to be explained to the player. When deciding what drills to use, I made sure to have a balanced number of technical drills, tactical drills, small area games, game situations as well as open ended (decision training) and closed drills. This allows the teaching points to be transferred into all drills that can be used. Again the specific drills are not the main focus it is what is being taught during the drill. Whether a coach uses technical drills, or decision training drills is not the focus of my manual. My manual is simply showing how to teach shooting with a purpose inside a multitude of different types of drills. The main key is to understand in every drill that has a shot in it, what kind of a shot it is; is it a shot you can reasonably expect to score on, or should the shooter be shooting to create a chance for a teammate. Once the coach understands what the focus for a shot in a drill should be, he can then make work to get the players thinking that as they're shooting.

Throughout the entire process from deciding on the topic, to the completion of the Drill Manual Mika Saarinen at the International Ice Hockey Centre of Excellence was instrumental in guiding my thought process and my development of both the theory and the manual. We had many lively discussions and debates, and he changed my mind on more than one occasion on my process and my philosophy. This manual was not commissioned by the International Ice Hockey Centre of Excellence, but without Mika's assistance, patience, time and effort, it would not have been possible. Robert Andersen, also from the Centre of Excellence also provided me with insight and technical assistance, as well as another lively debate partner. He will be putting the manual on the Centre of Excellence's website and I am grateful for the work that he did for this project.

## 12 Discussion

All shots are not created equal. Where the shot is being taken from, what type of shot to use, how obstructed is the goalie's view of the puck, how much time and space does the shooter have, how prepared is the goalie for the shot, is there a threat of a tip or redirect? All of these things must be considered when shooting the puck. In every team that I have been a part of, or observed for any length of time, and almost all the teams that I have observed just in passing, there has been a corporal punishment for missing the net with a shot during practice. Almost every team I have witnessed would frequently have the players do ten push-ups every time they missed the net in a shooting drill. If a player is punished with 10 push-ups every time he misses the net in practice, it is fairly easy to understand that a player will be more likely to shoot at the middle of the net. Aiming for the middle gives the player the largest room for error to avoid the embarrassment of having to do 10 push-ups in front of the whole team. The problem with shooting to hit the net, and therefore aiming at the middle of the net is; there is usually a goalie standing there. We are shooting to hit the goalie, instead of shooting to score. Of course we do not want to all of a sudden tell kids simply that it is ok to miss the net. The age-old-adage that "you can't score if you don't hit the net" is still true. However, it is almost equally difficult to score if you repeatedly hit the goalie in the stomach. Aiming at the areas of the net where you have the best chance to score increases dramatically the odds that you will miss the net. Further, when you are in an area where you are highly unlikely to score, it is not enough to merely hit the net; a shot must be taken that provides the best opportunity to create a scoring chance for your teammate. (Magnusson, 2010) It cannot simply be enough to yell at a player to "hit the net" and leave our instruction at that. In fact, I do not think it is ever a good instruction at all. "Take a shot more likely to create a rebound where the puck ends up in a high percentage scoring area" doesn't roll off the tongue quite as nicely, as "hit the net or you do 10 push-ups" but it might just provide a better platform for teaching the best way to shoot. Scoring isn't easy, and it's getting harder all the time but it can be done better. In order to make that happen shooters need to shoot with a purpose. We also have to make sure kids are getting enough technical practice, working on just the technique of shooting. If it takes 10,000 hours of deliberate practice to master a skill, then on ice practice is obviously not going to create enough

repetition to really master the skill. Some of the technical repetition needs to happen off the ice. It is not difficult nor is it expensive for teams and players to create “shooting pads” off the ice that are great for developing shooting technique. As well as practicing technical skills, our practices must be much better at simulating game situations. It is logical to suggest a progression, from technical skills, to small group or “tactical exercises” and finally ending in a game situation.(Pecknold 2009, 103) We must, as coaches include “rebound” shooters. Not just as a token but in as many drills as is practically possible. Remember that rebound shots at “32.8% [effective are] 3.7 times higher than the overall goal rate of 8.9%.” (Krzywicki 2010)

Players have to be taught the importance of rebounds and screening the goalie, and deflections. Not just told about these concepts, but given the opportunity in drills to repeat the process hundreds and thousands of time. They need to be taught how important a goalie’s preparation is to a save, and the different ways they can prevent that preparation; quick release, fakes, changing the angle. Putting these principals into practice is not easy. It requires thought, critical thinking, even meta thinking into how drills are run in practice and what the drills are attempting to accomplish. In Hard Core Hockey Bryan Daccord says “right now, kids are trained to tune out as soon as they shoot during drills: the shooter decreases his speed and skates back to the line, and the goalie slowly gets up after making the save and looks for the next shooter in the drill.” Daccord laments that this is not realistic for in a game after a shot the player has to battle to recover a loose puck, either for a rebound scoring chance, or to regain possession(Pecknold 2009, 103). Since we learned that the key to developing a skill is deliberate, highly repetitive practice with feedback,(McMorris 2004, 2) it is important that we make drills in practice that better simulate the actions that lead to a goal in a game. It is important that we put the effort into designing drills that touch on all these points. Shooting is only a small part of the game, the drills in the manual by no means would ever constitute an entire playing philosophy. However, I believe that it is important that every time a player shoots, they know why. Every time we as coaches ask a player to shoot, we know why, and every drill that has a shot included in it, should have an element of Shooting with a Purpose.

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